

1. Determine the vertical asymptotes and holes in the rational function below.

$$f(x) = \frac{4x^3 + 4x^2 - 33x - 45}{6x^2 - x - 15}$$

- A. Vertical Asymptote of $x = 1.667$ and hole at $x = -1.5$
 - B. Vertical Asymptote of $x = 0.667$ and hole at $x = -1.5$
 - C. Vertical Asymptotes of $x = 1.667$ and $x = -1.5$ with no holes.
 - D. Vertical Asymptotes of $x = 1.667$ and $x = -2.5$ with a hole at $x = -1.5$
 - E. Holes at $x = 1.667$ and $x = -1.5$ with no vertical asymptotes.
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2. Determine the vertical asymptotes and holes in the rational function below.

$$f(x) = \frac{12x^3 + 59x^2 + 29x - 60}{12x^2 + 35x + 25}$$

- A. Vertical Asymptote of $x = -1.25$ and hole at $x = -1.667$
 - B. Holes at $x = -1.25$ and $x = -1.667$ with no vertical asymptotes.
 - C. Vertical Asymptote of $x = 1.0$ and hole at $x = -1.667$
 - D. Vertical Asymptotes of $x = -1.25$ and $x = -1.667$ with no holes.
 - E. Vertical Asymptotes of $x = -1.25$ and $x = 0.75$ with a hole at $x = -1.667$
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3. Determine the vertical asymptotes and holes in the rational function below.

$$f(x) = \frac{9x^3 - 15x^2 - 2x + 8}{6x^2 + 19x + 10}$$

- A. Vertical Asymptotes of $x = -2.5$ and $x = -0.667$ with no holes.
- B. Vertical Asymptotes of $x = -2.5$ and $x = 1.333$ with a hole at $x = -0.667$
- C. Vertical Asymptote of $x = 1.5$ and hole at $x = -0.667$

- D. Vertical Asymptote of $x = -2.5$ and hole at $x = -0.667$
E. Holes at $x = -2.5$ and $x = -0.667$ with no vertical asymptotes.
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4. Determine the vertical asymptotes and holes in the rational function below.

$$f(x) = \frac{8x^3 - 2x^2 - 43x + 30}{6x^2 + 7x - 20}$$

- A. Holes at $x = 1.333$ and $x = -2.5$ with no vertical asymptotes.
B. Vertical Asymptote of $x = 1.333$ and hole at $x = -2.5$
C. Vertical Asymptote of $x = 1.333$ and hole at $x = -2.5$
D. Vertical Asymptotes of $x = 1.333$ and $x = 0.75$ with a hole at $x = -2.5$
E. Vertical Asymptotes of $x = 1.333$ and $x = -2.5$ with no holes.
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5. Determine the horizontal and/or oblique asymptotes in the rational function below.

$$f(x) = \frac{8x^3 - 46x^2 + 85x - 50}{4x^2 + 7x - 15}$$

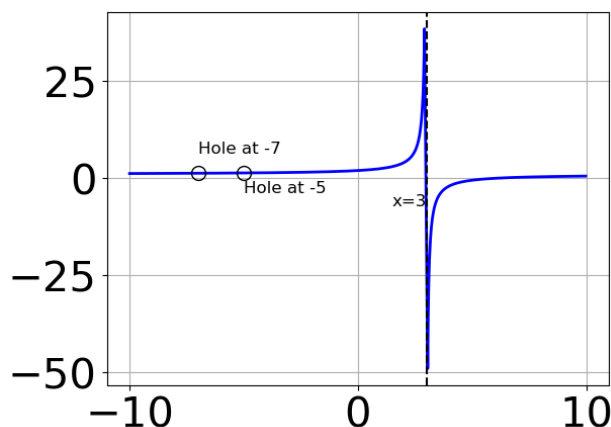
- A. Horizontal Asymptote of $y = -3.0$ and Oblique Asymptote of $y = 2x - 15$
B. Horizontal Asymptote of $y = 2.0$
C. Oblique Asymptote of $y = 2x - 15$.
D. Horizontal Asymptote of $y = 2.0$ and Oblique Asymptote of $y = 2x - 15$
E. Horizontal Asymptote at $y = -3.0$
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6. Determine the horizontal and/or oblique asymptotes in the rational function below.

$$f(x) = \frac{12x^3 + 11x^2 - 45x - 50}{8x^3 + 28x^2 - 26x - 20}$$

- A. Horizontal Asymptote of $y = 0$
- B. Vertical Asymptote of $y = -1.000$
- C. None of the above
- D. Vertical Asymptote of $y = 2$
- E. Horizontal Asymptote of $y = 1.500$

7. Which of the following functions *could* be the graph below?



- A. $f(x) = \frac{x^3 + 9.0x^2 - 108.0}{x^3 - 9.0x^2 - x + 105.0}$
- B. $f(x) = \frac{x^3 + 3.0x^2 - 36.0x - 108.0}{x^3 + 9.0x^2 - x - 105.0}$
- C. $f(x) = \frac{x^3 + 6.0x^2 - 37.0x - 210.0}{x^3 + 9.0x^2 - x - 105.0}$
- D. $f(x) = \frac{x^3 - 6.0x^2 - 37.0x + 210.0}{x^3 - 9.0x^2 - x + 105.0}$
- E. None of the above are possible equations for the graph.

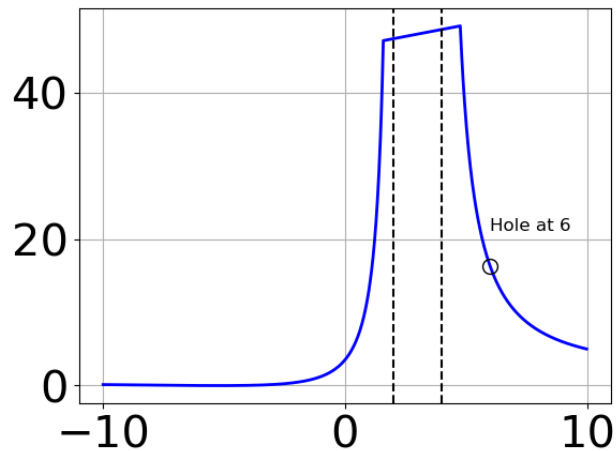
8. Determine the horizontal and/or oblique asymptotes in the rational function below.

$$f(x) = \frac{2x^2 - 3x - 9}{8x^3 + 22x^2 + 3x - 18}$$

- A. Horizontal Asymptote of $y = 0$
- B. Horizontal Asymptote at $y = 3.000$
- C. Horizontal Asymptote of $y = 0.250$ and Oblique Asymptote of $y = 4x + 17$
- D. Oblique Asymptote of $y = 4x + 17$.
- E. Horizontal Asymptote of $y = 0.250$

9. Which of the following functions *could* be the graph below?

$x=4$



$x=2$

A.
$$f(x) = \frac{x^3 + 5.0x^2 - 38.0x - 168.0}{x^3 - 12.0x^2 + 44.0x - 48.0}$$

B. $f(x) = \frac{x^3 - 5.0x^2 - 38.0x + 168.0}{x^3 + 12.0x^2 + 44.0x + 48.0}$

C. $f(x) = \frac{x^3 - 4.0x^2 - 49.0x + 196.0}{x^3 + 12.0x^2 + 44.0x + 48.0}$

D. $f(x) = \frac{x^3 + 18.0x^2 + 105.0x + 196.0}{x^3 - 12.0x^2 + 44.0x - 48.0}$

E. None of the above are possible equations for the graph.

10. Determine the horizontal and/or oblique asymptotes in the rational function below.

$$f(x) = \frac{6x^3 + 31x^2 + 45x + 18}{2x^2 + 13x + 15}$$

A. Horizontal Asymptote of $y = 3.0$ and Oblique Asymptote of $y = 3x - 4$

B. Horizontal Asymptote at $y = -5.0$

C. Horizontal Asymptote of $y = -5.0$ and Oblique Asymptote of $y = 3x - 4$

D. Horizontal Asymptote of $y = 3.0$

E. Oblique Asymptote of $y = 3x - 4$.
